

IN THE CLAIMS:

The pending claims are set forth below and have been amended and/or cancelled, without prejudice, where noted:

1-8. (Cancelled)

9. (Previously Presented) An olefin polymerization loop reactor system comprising:

- a) a loop reactor;
- b) at least one inlet for introducing an olefin monomer and a diluent carrier liquid into said loop reactor;
- c) a catalyst inlet for supplying a polymerization catalyst system to said loop reactor;
- d) a pump in said loop reactor effective for circulating said diluent liquid and olefin monomer through said loop reactor to provide for the polymerization of said olefin monomer in the presence of said catalyst system to produce a slurry of polymer fluff particles in said diluent carrier liquid;
- e) at least one settling leg connected to the loop reactor for receiving slurry from said reactor and sequentially discharging the settled polymer slurry from said at least one settling leg to withdraw polymer slurry from said reactor system;
- f) a rotating take-off valve in said settling leg which is operable to rotate from an initial 0° reference closed position to an intermediate open position and a final closed position in order to sequentially discharge the settled polymer slurry from said settling leg to withdraw said polymer slurry from said reactor system;
- g) a double acting activator for said take-off valve to rotate said valve from the initial closed position at a 0° reference to the intermediate position to open said valve and discharge polymer particles from said settling leg followed by continuing the rotation of said valve to the final reference position to close said valve followed by another cycle of operation in which the direction of rotation of said valve is reversed to rotate said valve from the final position to the intermediate position at which said valve is open to the initial reference position 0° at which said valve is closed;

h) a pneumatic controller for said activator which functions to alternately direct pneumatic fluid to one side of said activator while opening the other side of said activator to exhaust;

i) a supply and exhaust system for said pneumatic operator comprising at least one inlet conduit connected to a source of pneumatic fluid and another conduit connected to an exhaust zone for pneumatic fluid; and

j) at least two of said conduits having automatic control valves for opening and closing said conduits.

10. (Previously Presented) The system of claim 8 wherein said automatic control valves are pneumatic v-ball valves.

11. (Previously Presented) The reactor system of claim 9 wherein said valve is a 180.degree. rotating valve which is operable to rotate from the 0° reference closed position to a 90° intermediate open position and a 180° final closed position and said double acting activator rotates said valve from the closed position at a 0° reference to the intermediate 90° open position followed by continuing the rotation of said valve to the 180° position to close said valve through another cycle of operation in which the direction of rotation of said valve is reversed to rotate said valve from 180° to 90° at which said valve is open to 0° at which said valve is closed:

12. (Previously Presented) The reactor system of claim 9 further comprising sensors associated with said valve to said valve being at the 0 reference closed position and the final closed position for generating signals representative of said valve reaching said initial closed position and said final closed position and a rotation controller representative of information generated from said sensor signals to control said pneumatic controller.

13. (New) A method for operating an olefin polymerization loop reactor system comprising:

introducing an olefin, a polymerization catalyst, and a diluent carrier liquid into a loop reactor, wherein the loop reactor comprises a circulating pump, a settling leg and a 180° rotating product take-off valve operably connected to the settling leg for the removal of polymer therefrom;

contacting the olefin with the polymerization catalyst in the presence of the diluent carrier liquid to form a slurry of polymer particles within the loop reactor; and

withdrawing polymer particles from the settling leg through the 180° rotating take-off valve, wherein the polymer particles are withdrawn from the settling leg at a predetermined time interval, the predetermined time interval adapted to provide for removal of substantially all polymer particles from the settling leg with substantially no removal of olefin and diluent from the loop reactor; and

maintaining the predetermined time interval by automatically controlling and adjusting air flow passing to the 180° rotating take-off valve for operation thereof.